

**CLAIMS:**

1. A method comprising:
  - 2 converting a digital value of a signal from a first domain to a second domain by separately converting an exponent component and mantissa component of the digital value from the first domain to a second domain, and combining the converted exponent component and the converted mantissa component of the digital value in the second domain; and
  - 6 processing the converted digital value of the signal in the second domain.
2. The method of claim 1, wherein processing the converted digital value of the signal comprises scaling the converted digital values.
3. The method of claim 1, wherein the signal comprises a digital baseband signal generated from a spread spectrum waveform.
4. The method of claim 1, further comprising converting the processed digital value from the second domain to the first domain.
5. The method of claim 1, wherein converting the digital value of the signal comprises:
  - 2 selecting a logarithmic mantissa value from a set of logarithmic mantissa values based on the mantissa component;
  - 4 selecting a logarithmic exponent value from a set of exponent logarithmic values based on the exponent component; and
  - 6 combining the selected logarithmic mantissa value and the selected logarithmic exponent value.
6. The method of claim 5, wherein selecting a logarithmic mantissa value comprises:
  - 2 storing a subset of a plurality of logarithmic mantissa values; and
  - 4 deriving one of the logarithmic mantissa values not included in the subset from the stored subset based on the mantissa component.

7. The method of claim 1, further comprising converting the exponent  
2 component from the first domain to the second domain using an exponent lookup  
table; and  
4 converting the mantissa component from the first domain to the second  
domain using a mantissa lookup table.

8. The method of claim 1, further comprising truncating the combination of  
2 the converted exponent component and the converted mantissa component in the  
second domain.

9. The method of claim 1, further comprising rounding the combination of  
2 the converted exponent component and the converted mantissa component in the  
second domain.

10. The method of claim 1, wherein the first domain is a linear domain and  
2 the second domain is a non-linear domain.

11. The method of claim 10, wherein the second domain is a logarithmic  
2 domain using decibels as units.

12. The method of claim 1, wherein converting the mantissa component from  
2 the first domain to the second domain comprises performing a lookup in a  
mantissa table comprising a subset of a total number of mantissa values.

13. The method of claim 1, wherein converting the mantissa component from  
2 the first domain to the second domain comprises generating the mantissa  
component in the second domain by performing an interpolation and selecting an  
4 entry from a mantissa table comprising a subset of a total number mantissa values  
based on the interpolation.

14. The method of claim 13, wherein the interpolation is a nearest neighbor  
2 interpolation performed by rounding the mantissa component and right-shifting  
the rounded mantissa component.

15. The method of claim 1, wherein converting the mantissa component from  
2 the first domain to the second domain comprises generating the mantissa  
component in the second domain by left shifting the mantissa component in the  
4 first domain and selecting an entry from a mantissa table comprising a subset of a  
total number mantissa values based on a result of the left shift.

16. The method of claim 1, wherein converting the mantissa component from  
2 the first domain to the second domain comprises performing a lookup in a  
mantissa table including entries that comprise non-uniform sampling of a  
4 logarithmic function.

17. A method comprising:  
2 storing a subset of a total number of logarithmic mantissa values as  
entries in a mantissa table;  
4 deriving one of the logarithmic mantissa values not included in the subset  
from the subset; and  
6 combining the derived logarithmic mantissa value with a logarithmic  
exponent value to generate a logarithmic digital value of a signal.

18. The method of claim 17, wherein deriving one of the logarithmic mantissa  
2 values not included in the subset comprises generating one of the logarithmic  
mantissa values not included in the subset by performing a shifting operation on  
4 input and selecting one of the entries based on the shifted input.

19. A method of claim 17, wherein deriving one of the logarithmic mantissa  
2 values not included in the subset comprises generating an approximation of one  
of the logarithmic mantissa values not included in the subset by interpolating and  
4 then selecting one of the entries based on the interpolation.

20. A computer-readable medium carrying program code that when executed,  
2 converts a digital value of a signal from a first domain to a second domain by  
separately converting an exponent component and mantissa component of the  
4 digital value from the first domain to a second domain, and combining the  
converted exponent component and the converted mantissa component of the  
6 digital value in the second domain.

21. The computer-readable medium of claim 20, wherein the program code  
2 when executed converts the mantissa component of the digital value from the  
first domain to the second domain by  
4 storing a subset of a total number of logarithmic mantissa values as  
entries in a mantissa table;  
6 deriving one of the logarithmic mantissa values not included in the subset  
from the subset; and  
8 combining the derived logarithmic mantissa value with a logarithmic  
exponent value to generate a logarithmic digital value in the second domain.

22. An apparatus comprising:  
2 an exponent extractor that extracts an exponent component from a  
number;  
4 a mantissa extractor that extracts a mantissa component from the number;  
a first lookup table used to convert the exponent component from a first  
6 domain to a second domain;  
a second lookup table used to convert the mantissa component from the  
8 first domain to the second domain; and  
an adder that combines the exponent component and the mantissa  
10 component in the second domain.

23. The apparatus of claim 22, further comprising a shifter that truncates the  
2 combination of the exponent component and the mantissa component in the  
second domain.

24. The apparatus of claim 22, further comprising a shifter that rounds the  
2 combination of the exponent component and the mantissa component in the  
second domain.

25. The apparatus of claim 22, wherein the first domain is a linear domain  
2 and the second domain is a logarithmic domain using decibels as units.

26. The apparatus of claim 22, wherein the second lookup table is a mantissa  
2 table comprising a subset of a total number of mantissa values, the apparatus  
further comprising address manipulation logic that performs an interpolation,  
4 wherein an entry is selected from the mantissa table based on the interpolation.

27. The apparatus of claim 22, wherein the second lookup table is a mantissa  
2 table comprising a subset of a total number of mantissa values, the apparatus  
further comprising address manipulation logic that performs a shifting operation  
4 on input, wherein an entry is selected from the mantissa table based on the shifted  
input.

28. The apparatus of claim 27, wherein the second lookup table is a mantissa  
2 table including entries that comprise non-uniform sampling of a logarithmic  
function.

29. An apparatus comprising:  
2 memory that stores a subset of a total number mantissa values as entries in  
a mantissa table; and  
4 address manipulation logic that generates a mantissa value not included in  
the subset by performing an operation on input and selecting one of the entries  
6 based on a result of the operation.

30. The apparatus of claim 29, wherein the address manipulation logic  
2 generates the mantissa value not included in the subset by performing a shifting  
operation on input and selecting one of the entries based on the shifted input.

31. The apparatus of claim 29, wherein the address manipulation logic  
2 generates the mantissa value not included in the subset by interpolating and then  
selecting one of the entries based on the interpolation.